Elsevier Editorial System(tm) for International Journal of Nursing Studies
Manuscript Draft

Manuscript Number: IJNS-D-14-00738R2

Title: Therapist differences in a randomised trial of the outcome of cognitive behaviour therapy for health anxiety in medical patients

Article Type: Research Paper

Keywords: cognitive behaviour therapy
depression
generalised anxiety
health anxiety
hypochondriasis
medical out-patients
outcomes
randomised controlled trial
social functioning

Corresponding Author: Prof. Peter Tyrer, FMedSci

Corresponding Author's Institution: Imperial College London

First Author: Helen Tyrer, MRCGP, PhD

Order of Authors: Helen Tyrer, MRCGP, PhD; Peter Tyrer, FMedSci; Yvonne Lisseman-Stones, RGN; Sharon McAllister, RGN; Sylvia Cooper, BSc; Paul Salkovskis, PhD; Michael J Crawford, MD, FRCPsych; Simon Dupont, PhD; John Green , PhD; david murphy, MSc; Duolao Wang, PhD

Abstract: Background:
Health anxiety is common in medical settings and can be treated successfully by cognitive behaviour therapy (CBT). However it is not clear who might be best placed to deliver this therapy.
Objectives:
In a planned secondary analysis of data from a randomised trial of adapted cognitive behaviour therapy for health anxiety we compared outcomes of therapy delivered by nurses and other professional groups.

Design:
A randomised controlled trial with two treatment arms, 5-10 sessions of cognitive behaviour therapy adapted health anxiety (CBT-HA) or standard care. The study is registered as ISRCTN14565822.
Setting: Cardiology, endocrine, gastroenterology, neurological and respiratory clinics in six general hospitals in the UK covering urban, suburban and rural areas.

Participants: Medical patients attending the clinics who had pathological health anxiety and also scored for a diagnosis of hypochondriasis.

Methods:

Patients were randomised to one of two treatment arms, 5-10 sessions of cognitive behaviour therapy adapted health anxiety (CBT-HA) or standard care delivered by naive therapists (not randomised) who were trained in advance before delivering the treatment. Independent assessment of outcomes by researchers masked to allocation status at 3m, 6m, 12m and 24m.

Results: 444 patients were randomised in the trial, 219 to CBT-HA and 225 to standard care. 373 (84% ) completed assessments after two years. Those treated by nurses (n = 66) had improvement in health anxiety, generalised anxiety and depression outcomes that were significantly better and twice as great as those of the professional groups of assistant psychologists (n = 87) and graduate workers (n =66)($p<0.01$ over all time points). The number needed to treat (NNT) to show superiority of nurse-delivered treatment over other treatment delivery was 4 at 6 months and 6 at one year.

Conclusion: General nurses, after suitable training, are very effective therapists for patients with health anxiety in medical clinics and should be the therapists of choice for patients in these settings.

The study is registered as ISRCTN14565822.

Response to Reviewers: File attached with listed changes made in response to reviewer

**Cover Letter**

**Click here to download Cover Letter: cover letter nov.docx**

14th November 2014

Dear Professor Norman,

Thank you for the comments of your third reviewer. We have made the necessary changes.

Best wishes,

Peter Tyrer

# Therapist differences in a randomised trial of the outcome of cognitive behaviour therapy for health anxiety in medical patients

Helen Tyrer[1], Peter Tyrer[1], Yvonne Lisseman-Stones[2], Sharon McAllister[3], Sylvia Cooper[1], Paul Salkovskis[4], Michael J Crawford[1], Simon Dupont[5], John Green[6], David Murphy[7], and Duolao Wang[8]

1 Centre for Mental Health, Imperial College, Claybrook Road London, W6 8LN, UK

2 Department of Nursing, King's Mill Hospital, Sutton-in-Ashfield, Nottinghamshire, NG17 4JL

3 Medical Services, King Faisal Specialist Hospital, Riyadh, Saudi Arabia

4 Department of Psychology, University of Bath, Bath, BA2 7AY, UK

5 Greenacres Centre, Hillingdon Hospital, Pield Heath Road, Uxbridge UB8 3NN

6 Central and North West London NHS Foundation Trust, Hampstead Road, London, NW1 7QY, UK

7 Department of Clinical Psychology, Charing Cross Hospital, Fulham Palace Road, London. W6 8RF

8 Department of Clinical Sciences, Liverpool School of Tropical Medicine, Liverpool

Corresponding author: Peter Tyrer, e-mail address p.tyrer@imperial.ac.uk

***Contribution of the paper**

'What is already known about the topic?'

- Nurses have often been employed as therapists for psychological treatments but are not generally regarded as competent as psychologists
- Health anxiety (formally called hypochondriasis) is very common in hospital clinics where psychologists are not often present to give therapy
- Cognitive therapy for health anxiety is effective when given by trained psychologists

'What this paper adds'

- In this large randomised trial in medical out-patient clinics two general nurses with no psychological experience, after preliminary training and supervision, were significantly superior to psychologists and other therapists in reducing health anxiety and related mood symptoms both after 3 and 6 months and after 2 years
- The findings suggest that nurses in medical clinics would be ideally suited to provide cognitive behaviour therapy for health anxiety in hospital settings

***Author Checklist**

**IJNS AUTHOR CHECKLIST** ***Authors of all papers should submit this checklist together with their manuscript. The checklist will be made available during the submission process online to all authors and full step-by-step guidance given*****.**
*Part 1* identifies basic requirements for the manuscript submission *(mandatory for all submissions)*
*Part 2* identifies recognized guidelines for scientific reporting, which you should use to prepare your manuscript *(required for systematic reviews and original research)*
*Part 3* Is a self assessment checklist that is designed to help to ensure that your research or review manuscript meets basic standards and the journal's Guide for Authors. *(optional only)*

***PART 1 Basic requirements*** ***Author response or further detail*** **Tick**

Word count: Total word count including references: 5282
Was ethical approval given and by whom? (give any reference number): North Nottingham Ethics Committee (08/H0403/56)
Please state any conflicts of interest: Stated in paper. PS developed CBT-HA and HT has published a book describing the treatment (Tyrer H (2013). Tackling Health Anxiety: a CBT Handbook., RcPsych Press)

Please state sources of funding and the role of funders in the conduct of the research: This research was funded by the National Coordinating Centre for Health Technology Assessment (NCCHTA) programme (project number 07/01/26). The views expressed in this publication are those of the authors and do not necessarily refl ect those of the HTA programme, NIHR, NHS, or the Department of Health.

Please state any study registry number (e.g. ISRCTN): ISRCTN14565822

✓Title The title is in the format 'Topic / question: design/type of paper' and identifies the population / care setting studied.
*(e.g. The effectiveness of telephone support for adolescents with insulin dependant diabetes: controlled before and after study: the structure is optional for* discussion papers, editorials and commentaries*)*

✓Abstract A structured abstract appropriate to the design (see *guidelines for authors)*. Reports of controlled trials should follow the CONSORT format (does not apply to editorials or commentaries, Abstracts for discussion papers need not be structured)

✓Key words Between four and six key words have been provided in alphabetical order, which accurately identify the paper's subject, purpose, method and focus. Use the Medical Subject Headings (MeSH®) thesaurus or Cumulative Index to Nursing and Allied Health (CINAHL) headings where possible (see http://www.nlm.nih.gov/mesh/meshhome.html).

✓What the paper adds Points have been included that identify existing research knowledge relating to the specific research question / topic (what is already known) and a summary of the new knowledge added by this study *(see Guide for Authors*, does not apply to editorials or commentaries)

✓References Citations accord to the journal's format (Author, date) and reference list includes full details of all cited references in the proper format and alphabetical order (see *Guide for Authors)*

Other Published accounts
✓*All* published and in press accounts of the study from which data in this paper originate are referred to in the paper and the relationship between this and other publications from the same study is made clear (see *Guide for Authors*)

The study is referred to by a distinctive name which will be used in any future publications to identify that it as the same study.

✓Please upload copies of all previous, current and under review publications from this study and / or give full details below

Seivewright H, Green J, Salkovskis P, Barrett B, Nur U, & Tyrer P (2008). Randomised controlled trial of cognitive behaviour therapy in the treatment of health anxiety in a genitourinary medicine clinic. *British Journal of Psychiatry,* 192, 332-337.

Tyrer P, Cooper S, Tyrer H, Salkovskis P, Crawford M, Green J, Smith G,Reid S, Dupont S, Murphy D, Byford S, Wang D & Barrett B. (2011). CHAMP: Cognitive behaviour therapy for health anxiety in medical patients, a randomised controlled trial *BMC Psychiatry,* 11, 99
Tyrer P, Cooper S, Crawford M, Dupont S, Green J, Murphy D, Salkovskis P, Smith G, Wang D, Bhogal S, Keeling M, Loebenberg G, Seivewright R, Walker G, Cooper F, Evered R, Kings S, Kramo K', McNulty A, Nagar J, Reid S, Sanatinia R, Sinclair J, Trevor D, Watson C, Tyrer, H (2011). Prevalence of health anxiety problems in medical clinics. *Journal of Psychosomatic Research,* 71, 392-394.
Barrett B, Tyrer P, Tyrer H, Cooper S, Crawford MJ & Byford S. (2012). An examination of the factors that influence costs in medical patients with health anxiety. *Journal of Psychosomatic Research,* 73, 59-62.
Tyrer P, Cooper S, Salkovskis P, Tyrer H, Crawford M, Byford S, Dupont S, Finnis S, Green J, McLaren E, Murphy D, Reid S, Smith G, Wang D, Warwick H, Petkova H, & Barrett B. (2014). Clinical and cost-effectiveness of cognitive behaviour therapy for health anxiety in medical patients: a multicentre randomised controlled trial.. *Lancet,* 383, 219-225.

***PART 2***
***Standards of reporting***

The editors require that manuscripts adhere to recognized reporting guidelines relevant to the research design used. These identify matters that should be addressed in your paper. Please indicate which guidelines you have referred to.
These are not quality assessment frameworks and your study need not meet all the criteria implied in the reporting guideline to be worthy of publication in the IJNS. The checklists do identify essential matters that should be considered and reported upon. For example, a controlled trial may or may not be blinded but it is important that the paper identifies whether or not participants, clinicians and outcome assessors were aware of treatment assignments.
**You are encouraged (**although not required**) to submit a checklist from the appropriate reporting guideline together with your paper as a guide to the editors and reviewers of your paper.
*Reporting guidelines endorsed by the IJNS are listed below:*

**Guideline referred to**
**Checklist submitted****

Observational cohort, case control and cross sectional studies
STROBE **St**rengthening the **R**eporting of **Ob**servational Studies in **E**pidemiology
http://www.equator-network.org/index.aspx?o=1032

Quasi experimental / non-randomized evaluations
TREND - Transparent Reporting of Evaluations with Non-randomized Designs
http://www.equator-network.org/index.aspx?o=1032

Randomised (and quasi-randomised) controlled trial
✓CONSORT – Consolidated Standards of Reporting Trials
http://www.equator-network.org/index.aspx?o=1032

Study of Diagnostic accuracy / assessment scale
STARD Standards for the Reporting of Diagnostic Accuracy studies
http://www.equator-network.org/index.aspx?o=1032

Systematic Review of Controlled Trials
PRISMA - Preferred Reporting Items for Systematic Reviews and Meta-Analyses
http://www.equator-network.org/index.aspx?o=1032

Systematic Review of Observational Studies
MOOSE Meta-analysis of Observational Studies in Epidemiology
http://www.equator-network.org/index.aspx?o=1032

*Qualitative researchers might wish to consult the guideline listed below*
Qualitative studies COREQ: Consolidated criteria for reporting qualitative research Tong, A., Sainsbury, P., Craig, J., 2007. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care* 19 (6), 349-357. (http://dx.doi.org/10.1093/intqhc/mzm042)
Other (please give source)
Not applicable

# CONSORT 2010 checklist of information to include when reporting a randomised trial*

| Section/Topic | Item No | Checklist item | Reported on page No |
|---|---|---|---|
| **Title and abstract** | | | |
| | 1a | Identification as a randomised trial in the title | 1 |
| | 1b | Structured summary of trial design, methods, results, and conclusions (for specific guidance see CONSORT for abstracts) | 1 |
| **Introduction** | | | |
| Background and objectives | 2a | Scientific background and explanation of rationale | 3 |
| | 2b | Specific objectives or hypotheses | 4 |
| **Methods** | | | |
| Trial design | 3a | Description of trial design (such as parallel, factorial) including allocation ratio | 3 |
| | 3b | Important changes to methods after trial commencement (such as eligibility criteria), with reasons | |
| Participants | 4a | Eligibility criteria for participants | 4 |
| | 4b | Settings and locations where the data were collected | 3-4 |
| Interventions | 5 | The interventions for each group with sufficient details to allow replication, including how and when they were actually administered | 4 |
| Outcomes | 6a | Completely defined pre-specified primary and secondary outcome measures, including how and when they were assessed | 3 |
| | 6b | Any changes to trial outcomes after the trial commenced, with reasons | |
| Sample size | 7a | How sample size was determined | |
| | 7b | When applicable, explanation of any interim analyses and stopping guidelines | |
| Randomisation: | | | |
| Sequence generation | 8a | Method used to generate the random allocation sequence | 4 |
| | 8b | Type of randomisation; details of any restriction (such as blocking and block size) | 4 |
| Allocation concealment mechanism | 9 | Mechanism used to implement the random allocation sequence (such as sequentially numbered containers), describing any steps taken to conceal the sequence until interventions were assigned | 4 |
| Implementation | 10 | Who generated the random allocation sequence, who enrolled participants, and who assigned participants to interventions | 4 |
| Blinding | 11a | If done, who was blinded after assignment to interventions (for example, participants, care providers, those | |

| | | | |
|---|---|---|---|
| | | assessing outcomes) and how | |
| | 11b | If relevant, description of the similarity of interventions | 4 |
| Statistical methods | 12a | Statistical methods used to compare groups for primary and secondary outcomes | 6 |
| | 12b | Methods for additional analyses, such as subgroup analyses and adjusted analyses | 7 |
| **Results** | | | |
| Participant flow (a diagram is strongly recommended) | 13a | For each group, the numbers of participants who were randomly assigned, received intended treatment, and were analysed for the primary outcome | 15 |
| | 13b | For each group, losses and exclusions after randomisation, together with reasons | 15 |
| Recruitment | 14a | Dates defining the periods of recruitment and follow-up | |
| | 14b | Why the trial ended or was stopped | |
| Baseline data | 15 | A table showing baseline demographic and clinical characteristics for each group | |
| Numbers analysed | 16 | For each group, number of participants (denominator) included in each analysis and whether the analysis was by original assigned groups | 16-19 |
| Outcomes and estimation | 17a | For each primary and secondary outcome, results for each group, and the estimated effect size and its precision (such as 95% confidence interval) | 16-19 |
| | 17b | For binary outcomes, presentation of both absolute and relative effect sizes is recommended | |
| Ancillary analyses | 18 | Results of any other analyses performed, including subgroup analyses and adjusted analyses, distinguishing pre-specified from exploratory | 16-19 |
| Harms | 19 | All important harms or unintended effects in each group (for specific guidance see CONSORT for harms) | |
| **Discussion** | | | |
| Limitations | 20 | Trial limitations, addressing sources of potential bias, imprecision, and, if relevant, multiplicity of analyses | 10 |
| Generalisability | 21 | Generalisability (external validity, applicability) of the trial findings | |
| Interpretation | 22 | Interpretation consistent with results, balancing benefits and harms, and considering other relevant evidence | |
| **Other information** | | | |
| Registration | 23 | Registration number and name of trial registry | 1 |
| Protocol | 24 | Where the full trial protocol can be accessed, if available | 12 |
| Funding | 25 | Sources of funding and other support (such as supply of drugs), role of funders | 11 |

*We strongly recommend reading this statement in conjunction with the CONSORT 2010 Explanation and Elaboration for important clarifications on all the items. If relevant, we also recommend reading CONSORT extensions for cluster randomised trials, non-inferiority and equivalence trials, non-pharmacological treatments, herbal interventions, and pragmatic trials. Additional extensions are forthcoming: for those and for up to date references relevant to this checklist, see www.consort-statement.org.

# Therapist differences in a randomised trial of the outcome of cognitive behaviour therapy for health anxiety in medical patients

## Abstract

**Background:**

Health anxiety is common in medical settings and can be treated successfully by cognitive behaviour therapy (CBT). However it is not clear who might be best placed to deliver this therapy.

**Objectives:**

In a planned secondary analysis of data from a randomised trial of adapted cognitive behaviour therapy for health anxiety we compared outcomes of therapy delivered by nurses and other professional groups.

**Design:**

A randomised controlled trial with two treatment arms, 5-10 sessions of cognitive behaviour therapy adapted health anxiety (CBT-HA) or standard care. The study is registered as ISRCTN14565822.

**Setting:** Cardiology, endocrine, gastroenterology, neurological and respiratory clinics in six general hospitals in the UK covering urban, suburban and rural areas.

**Participants:** Medical patients attending the clinics who had pathological health anxiety and also scored for a diagnosis of hypochondriasis.

**Methods:**

Patients were randomised to one of two treatment arms, 5-10 sessions of cognitive behaviour therapy adapted health anxiety (CBT-HA) or standard care delivered by naive therapists (not randomised) who were trained in advance before delivering the treatment.

Independent assessment of outcomes by researchers masked to allocation status at 3m, 6m, 12m and 24m.

**Results:** 444 patients were randomised in the trial, 219 to CBT-HA and 225 to standard care. 373 (84% ) completed assessments after two years. Those treated by nurses (n = 66) had improvement in health anxiety, generalised anxiety and depression outcomes that were significantly better and twice as great as those of the professional groups of assistant psychologists (n = 87) and graduate workers (n =66)($p<0.01$ over all time points). The number needed to treat (NNT) to show superiority of nurse-delivered treatment over other treatment delivery was 4 at 6 months and 6 at one year.

**Conclusion:** General nurses, after suitable training, are very effective therapists for patients with health anxiety in medical clinics and should be the therapists of choice for patients in these settings.

The study is registered as ISRCTN14565822.

## Introduction

Health anxiety is a relatively new diagnosis in psychiatry that has partly replaced the previous one of hypochondriasis, now abandoned in the latest US classification, DSM-5[1-2]. Because of this change there are limited data on its prevalence but it does appear to be a common condition in the community (3.5%) [3] and in secondary medical care (20%)[4] . These figures for health anxiety are much greater than those for hypochondriasis, which is a confusing diagnosis of limited acceptability[5-6]. Health anxiety leads to unnecessary use of health services[7] because of additional medical consultations and investigations. Following a pilot study showing the effectiveness of cognitive behaviour therapy (CBT) delivered by expert therapists[8] we set up the CHAMP (Cognitive behaviour therapy for Health Anxiety in

Medical Patients) trial to examine the effectiveness and cost-effectiveness of a modified cognitive behavioural treatment for health anxiety (CBT-HA) with assessment of outcomes over a two-year period. At the time the study was formulated we planned to have all therapy delivered by nurses working in or close to the clinics concerned, in order to test a model that could be used to deliver therapy more widely if it were found to be successful. Unfortunately this was not possible (for mainly financial reasons) and so other therapists generally naive to the specific form of cognitive therapy to be given, including assistant psychologists and other graduate professionals were also included in the staff to deliver the therapy in our final protocol[9].

This paper is not concerned with the overall effectiveness of the treatment, as this has been demonstrated previously; there was greater benefit in the symptomatic improvement of health anxiety and generalised anxiety over the two year period[10]. This paper examines the outcome separated by therapist type, with a particular emphasis on the effectiveness of the therapy given by nurses and possible reasons given for this.

**Methods**

The CHAMP trial involved two parallel arms with randomization of eligible patients to 5-10 sessions of CBT-HA or to standard care in the clinics. Assessments of health anxiety, generalised anxiety, depression, social function, quality of life and costs were made over a two year period after randomization. The primary outcome was change in the score of health anxiety using a standard instrument[11]. Secondary hypotheses were that health anxiety at other time points, generalised anxiety and depression, social functioning and quality of life measured by standard measures[12-14] would differ between CBT-HA and standard care and that CBT-HA would be a cost-effective use of resources.

**Participants**

All patients over a 20 month period attending medical out-patient clinics in cardiology, endocrinology, gastroenterology, neurology and respiratory medicine in 6 general hospitals, King's Mill Hospital (North Nottinghamshire), St Mary's Hospital (London), Charing Cross Hospital (London), Hammersmith Hospital (London), Chelsea and Westminster Hospital

(London), and Hillingdon Hospital (Middlesex), were approached by research assistants by agreement with the staff concerned and offered the opportunity to complete a form described as 'a scale to see how much you worry about your health'. This scale, the Health Anxiety Inventory, was given to 28,990 people but only those who scored 20 or more on the scale were further involved.

***Randomisation and masking***

Eligible patients in whom consent was provided were allocated in a 1:1 ratio to the two arms of the study according to a computer-generated random sequence using block randomisation with varying blocksize of four and six. The allocation sequence was not available to any member of the research team until databases had been completed and locked. There was no randomisation of therapists as the provision of therapy was determined by the personnel available at each treatment site.

**Treatments**

**CBT-HA arm**

Cognitive therapy adapted for health anxiety (CBT-HA) was given to patients allocated to the active treatment group. This was based on the model first described by Salkovskis and Warwick[15] and, although based on standard cognitive therapy principles, differed in focusing especially on the need for reassurance, hypervigilance, and fear of (rather than actual) disease that are core to the condition. The plan outlined at the beginning was to offer between 5 and 10 sessions of one hour each but this was allowed to be flexible and booster sessions were also permitted after the end of therapy if required. The intention was to start treatment within two weeks of allocation and complete most therapy within 3-6 months.

**Standard care**

Patients allocated to standard care had information given about health anxiety in the course of baseline assessment but subsequently had no further psychological input. They continued to attend relevant practitioners in primary and secondary care as considered necessary.

**Therapists**

To reinforce the pragmatic nature of the trial we did not use experts in cognitive behaviour therapy to give the treatment as these are seldom available in medical settings except for specialised cases. Instead, naive therapists with an interest in administering the modified treatment were trained in two workshops carried out by four supervisors headed by PS and HT, and in addition each therapist received supervision from a more senior practitioner at 2-4 week intervals during therapy. Patients allocated to the CBT arm of the trial were allocated to the next available therapist. The type of therapist was not randomised and all were recruited from staff available at each site. Of a total of 17 therapists, 10 were psychologists in training, 5 were graduate workers (including one dietician), and two were nurses.

**Training and Fidelity of Intervention**

Four experts in the treatment trained the therapists at two workshops and also assessed treatment fidelity, together with HW. 50% of all treatment sessions were audio recorded. Fidelity was tested using the health anxiety modification of the Cognitive Therapy Rating Scale (CTRS-HAV)[16]. Recordings were assessed by the local supervisor and a random sample sent to a supervisor at a different site to assess the level of agreement, with further training ending only when an agreement level of 0.80 kappa was reached.

The study was approved by the North Nottingham Ethics Committee (08/H0403/56) prior to the start of data collection.

***Inclusion and exclusion criteria***

Those who satisfied the criteria for excessive health anxiety above were included if they were (i) aged between 16 and 75, (ii) resident in the area, (iii) had sufficient understanding of English to read and complete study questionnaires, and (iv) gave written consent for the interviews, audio-taping of 50% of treatment sessions, and (v) gave permission to access their medical records. The presence of existing medical pathology, provided it was not a

new diagnosis requiring further investigation, was not a study exclusion criterion. Those that were felt clinically to have a level of continuing major pathology that was too severe for them to take part in the study, including progressive cognitive impairment, terminal disorders, and any major comorbid pathology that would interfere with psychological treatment, those who were currently being actively investigated for significant pathology suspected by the clinician and for whom cognitive behaviour therapy might confuse or cause distress, and any currently under psychiatric care were also excluded.

Assessments of health anxiety (HAI),[11]anxiety and depression (HADS)[12] , social functioning (SFQ)[13] and health-related quality of life (EQ-5D),[14] were made at baseline and assessed independently by research assistants at 6m, 12m and 2 years. The quality of life measure was linked to the economic assessment and neither are being considered here. Health anxiety scores (HAI) were additionally recorded at 3 months.

**Statistical analysis**

The calculation of the sample size for the main study has been described previously[9], and was powered to assess the superiority of CBT-HA over standard care. The current study was an exploratory comparison of the outcomes of the different therapists and no formal sample size calculation was performed.

All analyses were based on the intention-to-treat principle. The primary endpoint was analysed using a mixed model with time, treatment group (nurses, graduate workers, assistant psychologists, and standard care), and time x treatment interaction as fixed effects, baseline measurement as covariate, and patient as random effect. The treatment differences between group comparisons, including one between nurses, graduate workers and assistant psychologists combined, were calculated at each time point (3m, 6m, 1 year and 2 years). These differences, together with their 95% confidence intervals (CI), were derived from the mixed model. Other secondary endpoints were analysed in the same way.

Other assessments were analysed in a similar way. In addition, the percentage of patients achieving normal levels of health anxiety (HAI≤10) or significant improvement (HAII≤15) were compared using a generalised estimating equation model with visit, treatment, interaction between visits and treatment as fixed effect, baseline measurement of HAI as covariate, and patient as random effect (an exchangeable covariance structure).

**Results**

**[Figure 1 near here]**

445 patients were randomised to the trial and 376 (76%) completed the follow-up after two years (Figure 1). One patient was randomised twice in error, both times to standard care; only the first of the assessments was used. Proportions followed up at other time points are shown elsewhere[10]. The 219 patients randomised to CBT-HA were seen by a total of 17 therapists. In patients allocated to CBT-HA there was a significantly greater reduction in both health anxiety and generalised anxiety symptoms than in the standard care group at all times of testing[10]. The present paper focuses on the differences between therapists in accounting for these differences.

[Tables 1 and 2 near here]

Of the 219 patients referred to CBT-HA, 66 (30%) were referred to nurses (n=2) for their treatment, 66 (30%) to graduate workers (n=5) and 87 (40%) to assistant psychologists (n=10). Details of the demographic characteristics of the 17 therapists are shown in Table 1. The two nurses differed from the other therapists in having less general knowledge of CBT, being paid higher salaries, and seeing more patients than other therapists. The three groups were chosen as they shared some common characteristics; nurses (both trained in general nursing), assistant psychologists (a relatively homogeneous group of psychologists who had some knowledge of CBT in theory and practice), and a more heterogeneous group of graduate workers, including a dietician, graduates in psychology or a related discipline who may have had teaching in CBT but very little in the way of practice, and a physician (HT) who

had much more experience and acted as a back-up in the study in all centres when no other therapists were available. Because of the limited availability of funding there were important differences in the distribution of therapists by site. Because funding and personnel were available for nurses to be employed at one site (Kings Mill Hospital, Nottinghamshire) almost all the patients treated there were seen by two nurses (SM and YL-S). The distribution by site of the three groups also showed great variation (Table 2).

***Outcome by therapist group***

15 patients did not respond to the invitation for treatment after randomisation and 6 more did not attend initially but did have some form of contact later. Of the numbers who did not attend any sessions there were fewest in the nurse group than in the other two (Table 2) but this was not significant ($\chi^2$ = 3.18, df 1, P=0.07). The mean number of CBT-HA treatment sessions was 6 (range 0-22). The overall differences between CBT-HA and standard care were highly significant at all assessment points, including 12 months, the primary outcome point (difference=2.98, 95% CI, 1.64 to 4.33, p<0.001). These differences were maintained in further analyses with site and baseline scores as covariates.

[Figure 2 and Tables 3-6 near here]

The primary outcome in the main trial was the change in HAI scores after 1 year. This showed a highly significant benefit for CBT-HA in the main trial[10] but when the results were separated by therapist type it was clear that the largest component of this difference came from the nurse-treated therapists, where significant superiority was found over the other groups and standard care at all time of testing. The differences at all time points are shown in Figure 2 and the statistical findings in Tables 3 and 4. This superiority was also shown to a lesser, but still significant degree for generalised anxiety (HADS-anxiety score)(overall p=0.002), depression (HADS-depression score)(P=0.02), and social functioning (SFQ)(p =0.03 at 6m and p = 0.06 overall)(Table 3). The number needed to treat (NNT) to show superiority of nurses over the other two therapy groups combined was 4 at 3m and 6m and 6 at one year.

The mean number of treatment sessions for each of the groups was 7.7 in the nurse group, 5.7 in the assistant psychologist one, and 4.7 in the graduate worker group, and linear regression of session numbers showed significantly greater number of sessions in the nurse treated group (P<0.001)(Table 5). The proportion of patients in the nurse-treated group who improved (a score of 15 or less on the HAI) at one year (the primary outcome point) was 53.2% compared with the graduate worker group (42.1%), assistant psychologists (25.3%) and standard care (21.8%)(p<0.01) and over all time points this superiority was even more marked (P<0.0001)(Table 6). Similar findings were shown in the proportions of those who recovered (ie, had an HAI score of 10 or less at one year) ranging from 24.2% in nurse-treated patients to 4% in those treated by assistant psychologists (p<0.01).

**Fidelity of therapists**

Assessments of the fidelity of therapists' treatment showed that all except one, an assistant psychologist, scored at an adequate competence level or higher, and this was confirmed by an independent assessor. The two nurses scored slightly above the 50$^{th}$ percentile of all therapists on the scale (details given in this format as the scale has not yet been validated) but five therapists scored higher, two of these were in the graduate group and three in the assistant psychologist one.

**Cost-effectiveness of nurses**

The study had a cost-effectiveness component built into the protocol[9] and the results overall showed the study was cost-neutral, but the total costs were dwarfed by the very large costs of those who had severe medical illnesses associated with their health anxiety (Nikita da Cunha, 2014, BSc thesis, Imperial College) and so savings elsewhere were small in comparison[10]. Excess treatment costs are not covered by grants in research supported by major research bodies in the UK and have to be provided by NHS Trusts or other bodies. We were fortunate in getting some funding from a subvention fund at the Department of Health to pay for the nurses and two therapists elsewhere and the other costs were met by NHS Trusts in London. But this funding was very difficult to obtain and most had to be provided at the lowest rate possible. It was therefore impossible to meet the original requirement for all, or even the majority, of therapists to be nurses working in the general hospitals.

**Discussion**

The results of this trial should be seen in the general context of the employment of nurses in the delivery of psychological treatments. It has been well demonstrated that naïve nurses, including both those who are generally and mental health trained, are competent at delivering behavioural and cognitive behaviour therapies in a range of medical settings, mostly for depressive symptoms[17-22] but this study is the first to suggest superiority of nurses over other professional disciplines, including psychologists. The main limitation of the study is that the patients were not randomised to the therapists and so there could be confounding factors.

---

The patients seen by the nurses had more treatment sessions and lower drop-out rates, and saw more patients than any of the other therapists. They also saw patients at only one site in the trial and had the same supervisor (HT) throughout. These may have accounted for a small part of the difference in efficacy, as better outcomes follow increased experience[23], but there is no reason to believe that patients with health anxiety are fundamentally different in North Nottinghamshire than elsewhere in the country. The possibility that nurses were better accepted by patients and were seen as more informed was not tested in the study but has resonance in explaining the differences. Both the nurses involved in the study were experienced mature general nurses, whereas most of the other therapists were considerably younger and less experienced. The obvious inference is that the nurses were naturally more knowledgeable about medical disorders than other therapists in other groups. It would therefore not be surprising that patients might have more confidence in being treated by a nurse, rather than a psychologist or other professionals independent of normal medical care. The lower drop-out rates in the nurse-treated group also supports the hypothesis that they were accepted more readily as therapists.

---

The findings of this trial suggest nurses would be more appropriate than assistant psychologists in delivering CBT-HA in medical settings. This conclusion has to be qualified in view of the comments above and needs to be replicated, not least as there are now many studies showing that psychologists, usually with signiciantly more training than the ones in our study, are very effective as therapists for pathological health anxiety[24-27] and also in development of the treatment by the Internet[28-29], where superiority of CBT-HA has been shown over stress management approaches[29]. The importance of the findings lies in the development of this treatment. If staff are to be trained to deliver CBT-HA in medical clinics nurses would seem to be a more appropriate choice than the current practice of referring patients to psychologists. This would also confer advantages in helping to destigmatise health anxiety by regarding it as a medical rather than psychiatric concomitant of health concerns. This form of management could be incorporated into medical clinics and be administered by trained staff such as cardiac rehabilitation nurses and other specialist staff in other medical clinics who treat repeated attenders, many of whom have existing medical pathology but who suffer unduly from persistent and unnecessary worry over their health. This change would add to the increasing interest in showing that nurses can take on some of the duties of medical staff effectively[30].

---

**Conflicts of interest:**

PC developed CBT-HA, and HT is the author of a book describing CBT-HA in practice.

**Acknowledgements:**

---

This research was funded by the National Coordinating Centre for Health Technology Assessment (NCCHTA) programme (project number 07/01/26). The views expressed in this publication are those of the authors and do not necessarily refl ect those of the HTA programme, NIHR, NHS, or the Department of Health. We particularly thank the North London and East Midlands hubs of the Mental Health Research Network, for adopting, promoting, and aiding recruitment in the trial. We thank Aaron T Beck for acting as adviser to the CHAMP project, Snigdha Kamarsu for literature help, and Gene Paykel (chair), Deborah Rutter, Paul Bassett, and John Brazier of the Data Monitoring and Ethical Committee and Richard Mayou (chair), Amrit Sachar, Rosemary Davidson, Devaka Fernando, Roger Mulder of the Trial Steering Committee, the therapists and supervisors who provided the treatment, particularly Kate Rhodes, Georgina Smith, and Elenor McLaren, Jayne Morton, Kevin Connelly Paul Shepherd, and Gail Marcuson as acting as the support group

(CHASSIS) in the study, Sharandeep Bhogal, Faye Cooper, Rachel Evered, Mary Keeling, Stephanie Kings, Kofi Kramo, Gemma Loebenberg, Antoinette McNulty, Amy Murphy, Jessica Nagar, Lorraine O'Connell, Sandra O'Sullivan, Kate Rhodes, Rahil Sanatinia, Richard Seivewright, Carol Sherwood, Julie Sinclair, David Trevor, Gemma Walker, and Charlotte Watson in their roles as research assistants and supervisors in the study. and the 107 consultants, but especially John Rowley, Marcus Harbord, and Maurice Partridge, who supported the study from its outset.

**REFERENCES**

1. American Psychiatric Association. Diagnostic and Statistical Manual for Mental Disorders, 5th Edition. Washington: APA. 2013. p.315.

2.Tyrer P, Tyrer H. The departure of hypochondriasis is no loss. Aust NZ J Psychiat*,* **48,** 772-773

3.Sunderland M, Newby JM, Andrews G. Health anxiety in Australia: prevalence, comorbidity, disability and service use. Br J Psychiatry 2013; 202: 56–61.

4.Tyrer P, Cooper S, Crawford M, Dupont S, Green J, Murphy D, et al (2011). Prevalence of health anxiety problems in medical clinics. *J Psychosom Res* 2011; 71**:** 392-94.

5. Creed F, Barsky A. A systematic review of the epidemiology of somatisation disorder and hypochondriasis. J Psychosom Res (2004); 56: 391–408

6. Bleichhardt G, Hiller W. Hypochondriasis and health anxiety in the German population. *Br J Health Psychol* 2007;12: 511-23.

7.Barsky AJ, Wyshak G, Klerman GL, Latham KS. The prevalence of hypochondriasis in medical outpatients. Soc Psychiatry Psychiat Epidemiol 1990; 25: 89–94.

8. Seivewright H, Green J, Salkovskis P, Barrett B, Nur U, Tyrer P. Randomised controlled trial of cognitive behaviour therapy in the treatment of health anxiety in a genitourinary medicine clinic. *BrJ Psychiatry* 2008; **192:** 332-7.

9. Tyrer P, Cooper S, Tyrer H, et al. CHAMP: cognitive behaviour therapy for health anxiety in medical patients: a randomised controlled trial. *BMC Psychiatry* 2011; 11: 99.

10**.** Tyrer P, Cooper S, Salkovskis P, Tyrer H, Crawford M, Byford S, et al. Clinical and cost-effectiveness of cognitive behaviour therapy for health anxiety in medical patients: a multicentre randomised controlled trial.. *Lancet* 2014; 383: 219-225.

11**.** Salkovskis PM, Rimes KA, Warwick HMC, Clark DM. The Health Anxiety Inventory: development and validation of scales for the measurement of health anxiety and hypochondriasis. *Psychol Med* 2002, 32: 843–53.

12. Zigmond AS, Snaith RP. The Hospital Anxiety and Depression Scale. *Acta Psychiatr Scand* 1983, 57: 361–70.

13.Tyrer P, Nur U, Crawford M, et al. The Social Functioning Questionnaire: a rapid and robust measure of perceived functioning. *Int J Soc Psychiatr* 2005; 51: 265–75.

14.EuroQol Group. EuroQol—a new facility for the measurement of health-related quality of life. *Health Policy* 1990; 16: 199–208.

15. Salkovskis P, Warwick HMC, Deale AC. Cognitive-behavioural treatment for severe and persistent health anxiety (hypochondriasis). *Brief Treat Crisis Interven* 2003; **3:** 353–68.

16. Young J, Beck AT. *Cognitive Therapy Scale Rating Manual*. Philadelphia, USA: Psychotherapy Research Unit, University of Pennsylvania, 1980.

17.Gega L, Norman IJ, Marks IM. Computer-aided vs. tutor-delivered teaching of exposure therapy for phobia/panic: randomized controlled trial with pre-registration nursing students. *Int J Nurs Stud* 2007;44:397-405.

18.Feng CY, Chu H, Chen CH, Chang YS, Chen TH, Chou YH, Chang YC, Chou KR. The effect of cognitive behavioral group therapy for depression: a meta-analysis 2000-2010. *Worldviews Evid Based Nurs* 2012;9:2-17.

19.Ekers D, Murphy R, Archer J, Ebenezer C, Kemp D, Gilbody S. Nurse-delivered collaborative care for depression and long-term physical conditions: a systematic review and meta-analysis. *J Affect Disord* 2013;149:14-22.

20. Ekers DM, Dawson MS, Bailey E. Dissemination of behavioural activation for depression to mental health nurses: training evaluation and benchmarked clinical outcomes. *J Psychiatr Ment Health Nurs* 2013;20:186-92.

21.Hendriks JM, Vrijhoef HJ, Crijns HJ, Brunner-La Rocca HP. The effect of a nurse-led integrated chronic care approach on quality of life in patients with atrial fibrillation. *Europace* 2014;16:491-9.

22.Markle-Reid M, McAiney C, Forbes D, et al. An interprofessional nurse-led mental health promotion intervention for older home care clients with depressive symptoms. *BMC Geriatr* 2014;14:62.

23.Seivewright H. *Prevalence and treatment of health anxiety in genitor-urinary medicine.* PhD Thesis, Imperial College, London, 2009.

24. Olatunji BO, Cisler JM, Deacon BJ. Efficacy of cognitive behavioural therapy for anxiety disorders: a review of meta-analytic findings. Psychiatr Clin North Am 2010;33: 557–77.

25. Clark DM, Salkovskis PM, Hackmann A, et al. Two psychological treatments for hypochondriasis: a randomized controlled trial. *Br J Psychiatry* 1998, 173: 218–25.

26. Sørensen P, Birket-Smith M, Wattar U, Buemann I, Salkovskis P. A randomized clinical trial of cognitive behavioural therapy versus short-term psychodynamic psychotherapy versus no intervention for patients with hypochondriasis. *Psychol Med* 2011; 41: 431–41.

27. McManus F, Surawy C, Muse K, Vazquez-Montes M, Williams JM. A randomized clinical trial of mindfulness-based cognitive therapy versus unrestricted services for health anxiety (hypochondriasis). *J Consult Clin Psychol* 2012; 80: 817–28.

28. Hedman E, Andersson G, Andersson E, et al. Internet-based cognitive-behavioural therapy for severe health anxiety: randomised controlled trial. *Br J Psychiatry* 2011; 198: 230–36.

29. Hedman E, Axelsson E, Görling A, et al. Internet-delivered exposure-based cognitive-behavioural therapy and behavioural stress management for severe health anxiety: randomised controlled trial. *Br J Psychiatry* 2014; 205:307-14.

30. Zimmermann T, Puschmann E, Ebersbach M, Daubmann A, Steinmann S, & Scherer M. Effectiveness of a primary care based complex intervention to promote self-management in patients presenting psychiatric symptoms: study protocol of a cluster-randomized controlled trial. *BMC Psychiatry* 2014 ;14:2.

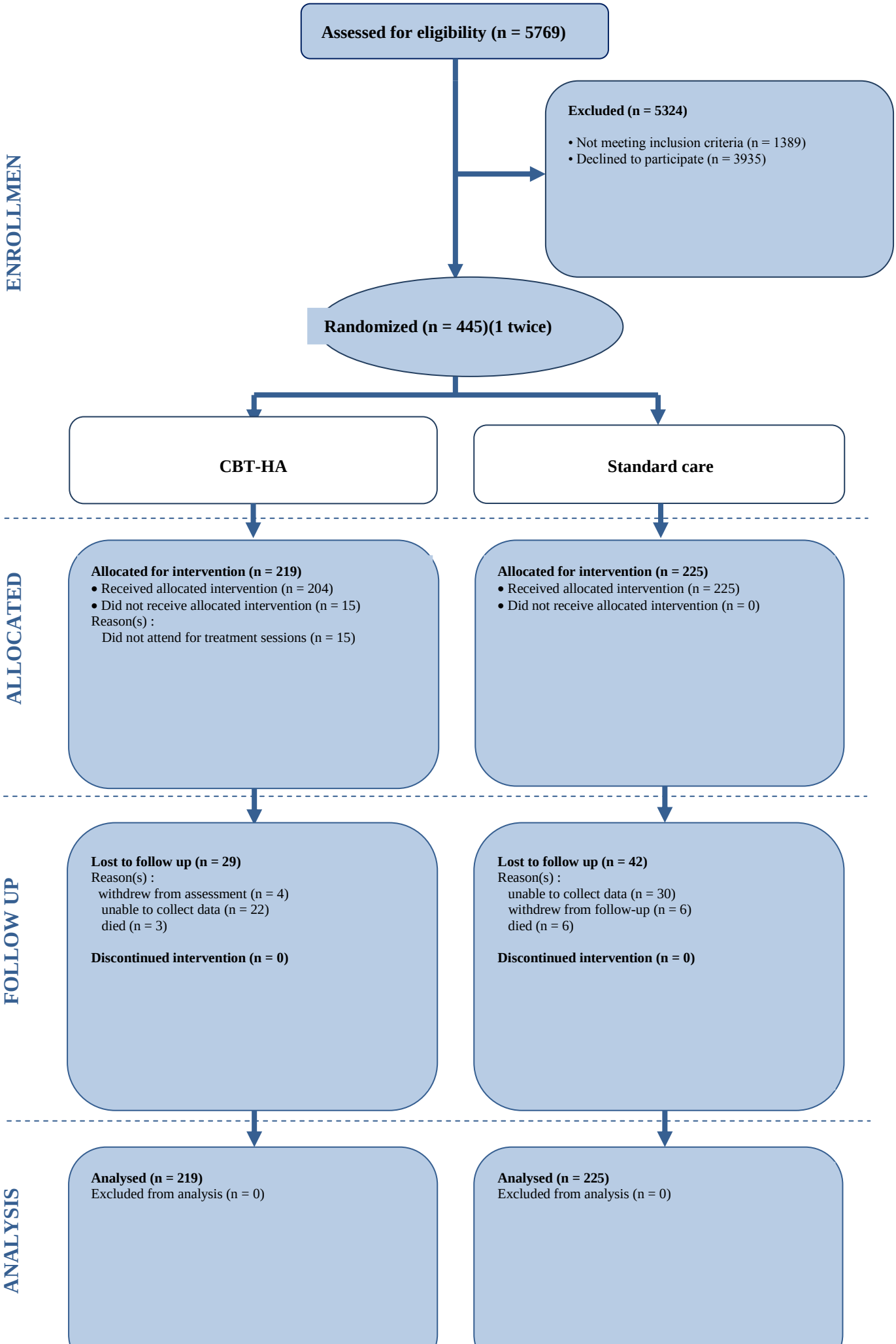
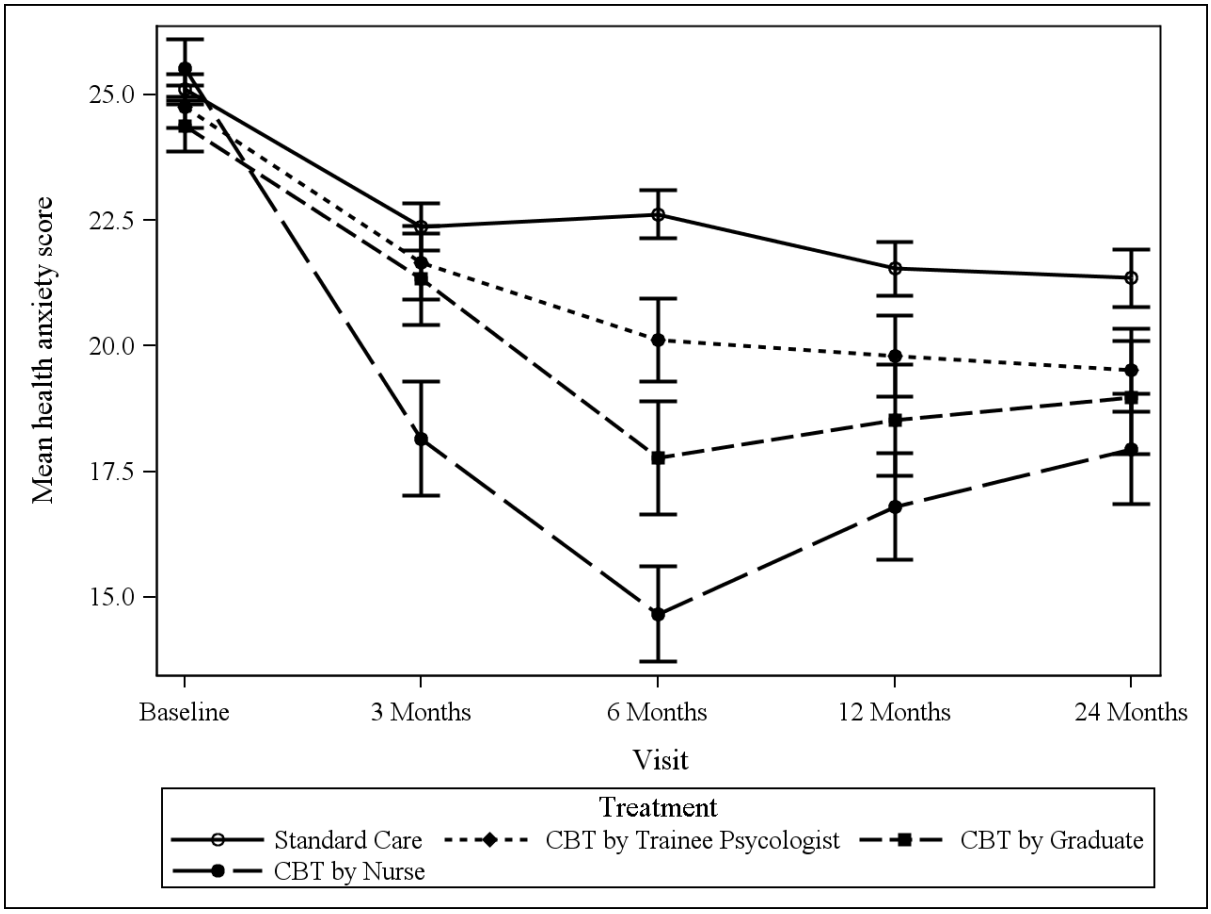

Assessed for eligibility (n = 5769)
Excluded (n = 5324)
• Not meeting inclusion criteria (n = 1389)
• Declined to participate (n = 3935)
ENROLLMEN
Randomized (n = 445)(1 twice)
CBT-HA
Standard care
ALLOCATED
Allocated for intervention (n = 219)
• Received allocated intervention (n = 204)
• Did not receive allocated intervention (n = 15)
Reason(s) :
Did not attend for treatment sessions (n = 15)
Allocated for intervention (n = 225)
• Received allocated intervention (n = 225)
• Did not receive allocated intervention (n = 0)
FOLLOW UP
Lost to follow up (n = 29)
Reason(s) :
withdrew from assessment (n = 4)
unable to collect data (n = 22)
died (n = 3)
Discontinued intervention (n = 0)
Lost to follow up (n = 42)
Reason(s) :
unable to collect data (n = 30)
withdrew from follow-up (n = 6)
died (n = 6)
Discontinued intervention (n = 0)
ANALYSIS
Analysed (n = 219)
Excluded from analysis (n = 0)
Analysed (n = 225)
Excluded from analysis (n = 0)

**Figure 1 - Consort diagram – attached separately as not sure if needed**

**Figure 2: Mean differences from baseline in Health Anxiety Inventory (HAI) scores between the outcomes of 219 patients with health anxiety treated by nurses (n=66), graduate workers (n=66) and assistant psychologists (n=87) at four time points in the CHAMP trial**




See Table 3 for details of statistical differences

**Table 1. Differences in experience and knowledge of CBT by therapist type**

| Group for analysis of data | Years of professional experience | Previous training in CBT | Previous experience in delivering CBT | Total patients referred | Total patients not seen (%) |
|---|---|---|---|---|---|
| Nurses (n=2)(Band 6) | >25 | 0% | 0% | 66 | 3 (4.5) |
| Graduates (n = 5) | 5-26 | 40% | 20% | 66 | 10 (15) |
| Assistant psychologists (n=10) | <10 | 100% | 50% | 87 | 8 (10.3) |

**Table 2. Distribution of therapist discipline in the cognitive therapy (CBT-HA) group by hospital site**

| Site | Nurses | Graduates | Assistant psychologists | Total referred | Total seen |
|---|---|---|---|---|---|
| Kings Mill Hospital, Nottinghamshire | 66 | 4 | 0 | 70 | 66 |
| Charing Cross Hospital and Hammersmith Hospitals, London | 0 | 27 | 4 | 31 | 28 |
| St Mary's Hospital, London | 0 | 6 | 30 | 36 | 28 |
| Chelsea & Westminster Hospital, London | 0 | 25 | 1 | 26 | 23 |
| Hillingdon Hospital, Middlesex | 0 | 4 | 52 | 56 | 53 |
| Totals | 66 | 66 | 87 | 219 | 198 |

**Table 3 : Comparison of health anxiety outcome using the Health Anxiety Inventory (HAI) separated by therapist group in 444 randomised patients**

| | | N, mean(SD) | | | | | Difference between nurses and other groups Mean (95% CI), p-value |
|---|---|---|---|---|---|---|---|
| | Visit | **Standard care** | **CBT by** Assistant psychologists | **CBT by Graduates** | **CBT by Nurses** | **All** | |
| **Mean scores on Health Anxiety Inventory (HAI)** | Baseline | 225, 25.12(4.52) | 87, 24.76(3.91) | 66 24.38(4.15) | 66, 25.53(4.67) | 225 25.12(4.52) | |
| | 3 Months | 212 22.37(6.71) | 82 21.65(6.62) | 59 21.33(6.97) | 64 18.15(9.07) | 212 22.37(6.71) | 4.10 (6.1-3.1) P<0.0001 |
| | 6 Months | 204 22.62(6.81) | 78 20.13(7.26) | 56 17.77(8.42) | 63 14.67(7.53) | 204 22.62(6.81) | 4.93 (7.0-2.9) P<0.0001 |
| | 12 Months | 193 21.54(7.45) | 75 19.80(6.96) | 57 18.53(8.31) | 62 16.81(8.31) | 193 21.54(7.45) | 3.24 (5.3-1.2) P<0.002 |
| | 24 Months | 183 21.35(7.67) | 76 19.51(7.22) | 53 18.98(8.14) | 61 17.95(8.63) | 183 21.35(7.67) | 2.49 (4.5-0.5) P<0.02 |
| | All periods | | | | | | 3.7 (5.4-2.0) P<0.0001 |

**Table 4 : Comparison of generalised anxiety and depression (HADS), and social functioning outcomes (SFQ) separated by therapist group in 444 randomised patients**

| | | N Mean(SD) | | | | | Difference between nurses and other groups Mean (95% CI), p-value |
|---|---|---|---|---|---|---|---|
| **Measure** | **Visit** | **Standard care** | **CBT by Assistant psychologists** | **CBT by Graduates** | **CBT by Nurses** | **All** | |
| Hospital Anxiety and Depression Scale -HADS Anxiety | Baseline | 225 12.25(3.88) | 87 12.45(3.77) | 66 12.62(3.57) | 66 12.65(3.91) | 444 12.41(3.81) | |
| | 6 months | 204 10.96(4.16) | 78 10.63(4.37) | 56 9.96(4.99) | 63 8.51(4.61) | 401 10.37(4.47) | 1.90 (3.1-0.7) P<0.002 |
| | 12 months | 192 10.57(4.33) | 75 10.37(4.04) | 57 9.84(5.01) | 62,9 06(4.38) | 386 10.18(4.41) | 1.28 (2.5-0.1) P=0.035 |
| | 24 months | 181 10.13(4.74) | 75 9.27(4.13) | 53 10.00(4.17) | 61,8 54(4.70) | 370 9.67(4.56) | 1.51 (2.7-0.3 P=0.013 |
| | All periods | | | | | | 1.6 (2.5-0.6) P=0.002 |
| Hospital Anxiety and Depression Scale – HADS Depression | Baseline | 225 8.83(4.58) | 87,8 53(3.83) | 66 8.65(3.99) | 66 10.36(5.06) | 444 8.97(4.46) | |
| | 6 months | 204 8.43(4.71) | 78 8.38(5.14) | 56 7.50(4.57) | 63 7.57(4.39) | 401 8.16(4.73) | 1.47 (2.7-0.3) P=0.02 |
| | 12 months | 192 8.41(4.90) | 75 8.27(5.32) | 57 7.35(4.85) | 62 8.10(5.02) | 386 8.18(4.99) | 0.77 (2.0-(- 0.5)) ns |
| | 24 months | 181 8.34(5.31) | 75 8.00(5.44) | 53 7.77(4.99) | 61 7.74(5.04) | 370 8.09(5.23) | 1.43 (2.7-0.2) P=0.02 |
| | All periods | | | | | | 1.22 (2.3-0.2) P=0.02 |
| Social Functioning Questionnaire (SFQ) | Baseline | 225 9.49(4.32) | 87,9.09(4.82) | 66,9.51(4.45) | 66,9.77(4.92) | 444,9.45(4.52) | |
| | 6 months | 204 9.28(4.86) | 78,10.02(5.30) | 56,8.40(5.59) | 63,8.35(4.89) | 401,9.15(5.07) | 1.32 (2.5-0.13) P=0.03 |
| | 12 months | 192 9.11(5.06) | 75,9.07(4.94) | 57,8.97(5.94) | 62,8.60(4.91) | 386,9.00(5.14) | 0.81 (2.0-(-0.39)) ns |
| | 24 months | 182 8.69(5.07) | 76,8.51(5.24) | 53,8.09(5.33) | 61,8.27(4.70) | 372,8.50(5.07) | 0.76 (2.0-(-0.44)) ns |
| | All periods | | | | | | 0.96 (2.0-(-0.04)) P=0.06 |

**Table 5: Summary results from linear regression analysis of number of sessions separated by therapist group**

| Comparison | Difference | 95% CI | | Probability |
|---|---|---|---|---|
| | | Lower Limit | Upper Limit | |
| Graduates vs Assistant psychologists | -0.97 | -2.26 | 0.32 | 0.1396 |
| Nurses vs Assistant psychologists | 2.03 | 0.74 | 3.32 | 0.0022 |
| Nurses vs Graduates | 3.00 | 1.63 | 4.37 | <.0001 |
| Nurses vs other groups combined | 2.52 | 1.35 | 3.68 | <.0001 |

**Table 6. Proportions of patients showing significant improvement (HAI≤15) after one year**

| **Therapist** Group | Phase in trial | Number of patients (%) with HAI scores ≤15 | Odds ratio of improvement compared with standard care -all times (sig) | 95% Confidence Interval |
|---|---|---|---|---|
| Standard care | 3 months | 31 (14.6) | | |
| | 6 months | 30 (14.7) | | |
| | 12 months | 42 (21.8) | | |
| | 24 months | 43 (23.5) | | |
| CBT-HA – Assistant psychologists | 3 months | 16 (19.5) | 1.58 (P =0.05) | 0.99-2.51 |
| | 6 months | 24 (30.8) | | |
| | 12 months | 19 (25.3) | | |
| | 24 months | 22 (28.9) | | |
| CBT-HA - Graduates | 3 months | 10(16.9) | 2.05 (P =0.005) | 1.25-3.36 |
| | 6 months | 24(42.9) | | |
| | 12 months | 24(42.1) | | |
| | 24 months | 18(34.0) | | |
| CBT-HA - Nurses | 3 months | 28(43.8) | 3.16 (P<0.0001) | 1.97-5.06 |
| | 6 months | 40(63.5) | | |
| | 12 months | 33(53.2) | | |
| | 24 months | 27(44.3) | | |

RESPONSE TO REVIEWER 3

Reviewer #3: The changes the authors have made to this paper have much improved it and I would support it's publication. The only comment I have is that there is still a suggestion that the comparison was with trained "qualified" psychologists in places and this needs to be changed.

The changes required are:

1. What this paper adds - first bullet point - should say perhaps '...significantly superior to other naïve therapists including assistant psychologists'

Response: Change made to 'What this paper adds' to include this
2. Discussion, first paragraph ...'...the first to suggest superiority of nurses over assistant psychologists"

Response: Done

3. Discussion, second paragraph, penultimate sentence: '...rather than an assistant psychologist or other naïve therapist' (it said 'other health professional but some weren't - a psychology graduate is not a health professional)

Response: There is no agreement on this – many assistant psychologists would regard themselves as integral health professional but we have removed the adjective 'health'. 4.

4. Discussion, third paragraph first sentence'... more appropriate than assistant psychologists ...'

Response: Done

5. Discussion, third paragraph second sentence '... there are now many studies showing that trained? psychologists ...' - are these studies you cite with assistant psychologists or qualified ones? perhaps specify?

Most of these have used trained psychologists (from our knowledge of the people involved) but in many of them there is no mention of training, but 'most' has been added as a reasonable qualifying adverb.

**What this paper adds**

We already know that nurses are competent at delivering many forms of psychological therapy once they have been sufficiently trained. This paper shows that for a specific form of therapy, cognitive behaviour therapy adapted for health anxiety given to medical patients, the performance of general nurses trained specifically in this treatment, is significantly superior to other naïve therapists including assistant psychologists in both the short term and over a two year period. Nurses should be the therapists of choice in this setting.